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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/507,054

06/13/2005

Theodor Doll

Mic.7745

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08/20/2009

O'Shea Getz P.C.

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EXAMINER

EOM, ROBERT J

ART UNIT

PAPER NUMBER

1797

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/507,054	<b>Applicant(s)</b> DOLL ET AL.	
	<b>Examiner</b> ROBERT EOM	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4-12 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-12, and 16-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/20/2009</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 12, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al. (USP 6,294,401 B1).

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Regarding claims 1, 12, 16, and 19, Jacobson discloses a thin film transistor device (**fig. 1**) comprising a substrate (**110**); a gate electrode deposited onto the substrate (**115**); a CdSe semiconductor layer (**125**); an insulator layer located between the CdSe semiconductor layer and the gate electrode (**120**); and a source and a drain electrode electrically in contact with the CdSe semiconductor layer. While Jacobson does not explicitly disclose any specific thickness of the insulator layer, the change in the thickness of the insulator layer is not considered to confer patentability to the claims. As the electric field produced by the field electrode(s), and therefore the sensitivity controllability is a variable that can be modified, by adjusting said thickness of the insulator layer, with controllability increasing as the thickness is decreased, the precise thickness would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed thickness of the insulator layer cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the thickness of the insulator layer in the apparatus of Jacobson to obtain the desired sensitivity controllability (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

5. Claims 4-8, 10, 11, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al. (USP 6,294,401 B1), as applied to claims 1 and 12

above, in view of Scheinert et al. (Electrically controlled metal oxide gas sensor designed with PROSA-CHEM).

Regarding claims 4, 5, and 17, Jacobson discloses all of the claim limitations as set forth above. While Jacobson does not explicitly disclose a plurality of individually drivable field electrodes, Scheinert teaches a metal oxide gas sensor (**Fig. 8**) comprising with three individually drivable buried gates (**see: buried gates, each with an individual lead**). It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute the single gate electrode of Jacobson with a group of individually drivable gate electrodes, as taught by Scheinert, since doing so provides for increased control of the selectivity and sensitivity of the gas sensor (**Scheinert: pg 359-360 Conclusion**).

Regarding claims 6-8 and 18, Jacobson discloses all of the claim limitations as set forth above. While Jacobson does not explicitly disclose an integrated heater electrode or an integrated temperature control driver electronics, Scheinert teaches a metal oxide gas sensor chip (**Fig. 10**) comprising an integrated heater and a temperature sensor (**pg 358, see: Chip Layout**). It would have been obvious to one having ordinary skill in the art at the time of the invention to integrate a heater and temperature control means into the thin film transistor device of Jacobson, as taught by Scheinert, since the dependency on temperature of FET based sensors is notoriously well known (**Scheinert: Figure 6**), therefore the addition of a temperature control means would provide improved control and measurement consistency.

Regarding claim 10, modified Jacobson discloses all of the claim limitations as set forth above. Scheinert further discloses the spacing between the buried gates is on the order of the grain size of the gas sensitive semiconductor film (**see: p359/C1/L4 discloses the SnO<sub>2</sub> layer is about 55 nm thick; p358/C1/L3 discloses the grainsize to be 50 nm; note the similar size between the thickness of the SnO<sub>2</sub> layer and the space between the buried gates in Figure 8**).

Regarding claim 11, modified Jacobson discloses all of the claim limitations as set forth above. Scheinert further discloses the gas sensitive semiconductor film comprises SnO<sub>2</sub> (**Figure 6, see: SnO<sub>2</sub>**).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson et al. (USP 6,294,401 B1), as applied to claim 1 above, in view of Hijikihigawa et al. (USP 5,140,393).

Regarding claim 9, Jacobson discloses all of the claim limitations as set forth above. While Jacobson does not explicitly disclose the thickness of the gas-sensitive semiconductor film being at most approximately one-hundred times greater than a Debye length of the gas-sensitive film, Hijikihigawa teaches a semiconductor gas sensor device (**C4/L45**) which utilizes a sensitive tin oxide film (**C4/L68-C5/L1**) with the thickness of the tin oxide film (**FIG. 1(a), see: distance d**) is preferably as large as the Debye length (**C4/L19-24**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the, at most approximately one-hundred times greater than the Debye length of the gas-sensitive film, thickness of the

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gas-sensitive semiconductor film of Jacobson, as taught by Hijikihigawa, to produce a gas sensor with an optimum value for the thickness of the gas sensitive layer with improved detection sensitivity (**Hijikihigawa: C5/L25-29**).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1 and 12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/  
Primary Examiner, Art Unit 1797

/R. E./  
Examiner, Art Unit 1797